Diagnosis and Management of Female Urinary Incontinence

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Urinary incontinence is a prevalent condition affecting an estimated 13 million Americans of which 85% are women. The types of incontinence as well as their diagnosis and management are presented herein.

Introduction

Urinary incontinence (UI) is defined as the involuntary loss of urine. Incontinence is a symptom not a disease and is quite common. The agency for Health Care Policy and Research reported that approximately 13 million Americans have UI of which 85% are women.[1] The incidence of UI increases with age; however it is not limited to the elderly. Ten to twenty five percent of women between age 15 and 64 have UI.[1] The societal cost of incontinence in the United States in 1995 has been estimated to be over 26 billion dollars for only those patients 65 years and older.[2] Incontinence produces emotional and physical discomfort, often causing individuals to limit their activities for fear of ridicule or potential loss of self-esteem and resulting in depression. Despite this, it has been estimated that only 10% people with incontinence seek medical help for their incontinence. Recently, there has been a number of advances in the diagnosis and management of UI. Health care providers should be aware of these advances and take an active role in the diagnosis and management of UI with a goal of decreasing the impact of this symptom upon our society.

Types of Incontinence

There are several types of incontinence which fall into two basic functional defects. Either the bladder fails to properly store urine or the urethra fails to act as an effective sphincter. Bladder causes of UI include: urge incontinence and overflow incontinence. Urethral causes include: stress urinary incontinence and instrinsic sphincter deficiency.

Urge incontinence occurs when the bladder contracts without permission either with or without warning. Commonly this is manifested by a person who gets the urge to void but leaks prior to reaching the toilet. When urge incontinence is secondary to a neurological lesion, such as cerebrovascular accident, Alzheimer's disease, or multiple sclerosis, it is known as detrusor hyperreflexia. Urge incontinence from a non-neurological etiology is known as detrusor instability.

Overflow incontinence occurs when a full bladder overcomes the resistance of the urinary sphincter and overflows. This form of UI is associated with diabetes mellitus or pelvic trauma that disrupts the normal sensation of the bladder. Consequently, the patient is unaware that his or her bladder is full.

Stress urinary incontinence (SUI) occurs when urethral hypermobility causes leakage in response to increases in intra-abdominal pressure (stress). It is associated with exercise,sneezing, coughing, lifting or Valsalva. When the urethra is hypermobile, a pressure differential between the bladder and urethra occurs with increases in intra-abdominal pressure (stress). This pressure differential overcomes the urethral resistance, producing incontinence.

Instrinsic sphincter deficiency (ISD) is similar to SUI but leakage occurs with a minimal increase in intra-abdominal pressure and the urethra is often well supported. ISD should be suspected in-patients who have persistent incontinence following an incontinence procedure.

History

The history should assess the risk factors associated with incontinence in an attempt to differentiate which type of incontinence exists. Pertinent questions include:

- frequency, duration, and timing of UI?
- when do you leak (cough, straining, on the way to the toilet)?
- neurologic problem?
- number and type of pads used per day?
- menopause/hormonal replacement?
- history of previous pelvic, vaginal, or incontinence surgeries?
- constipation and/or encopresis?
- frequent urinary tract infections (UTI)?
- is this condition lifestyle limiting?
- number of pregnancies, deliveries, vaginal vs. c-section?

Urge incontinence is usually preceded by a strong desire to void. Patients often will complain of having "accidents" on the way to the toilet. Overflow incontinence typically causes frequent or constant dribbling as additional urine enters the full bladder. Whereas SUI and ISD both present as UI with exertion (increased intra-abdominal pressure) but differ in that ISD is associated with minimal exertion.

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Fig 1.—Urethral hypermobility. The arrow indicates direction of pressure from an activity such as coughing, causing the bladder neck and urethra to open briefly. Reference 3.

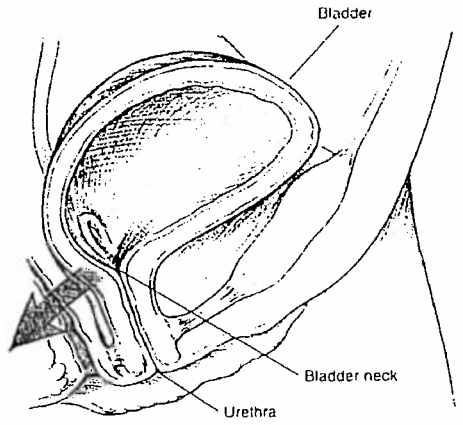
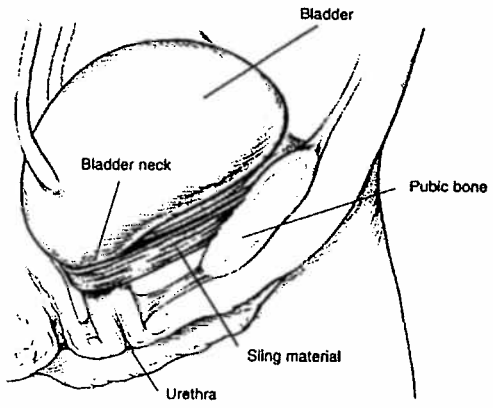


Fig 2.—Sling in place, secured to the pubic bone. Reference 3.



Physical Examination

A thorough physical examination (PE) of the vagina and the rectum is performed to rule out atrophic vaginitis and/or neurological deficit. The anterior vagina is visualized as the patient Valsalvas with a full bladder to determine the presence of and grade of a cystocele. A digital rectal examination is performed to determine the strength of the anal sphincter and the support of the posterior vagina. A rectocele is herniation of the anterior rectum into the vagina on Valsalva secondary to decreased posterior vaginal support. The urethra should be evaluated for hypermobility (Figure 1). A simple method involves placing a lubricated cotton tipped applicator in the urethra and have the patient Valsalva. The applicator should initially be horizontal (supine patient), with Valsalva the applicator should rotate less than 15°. A rotation greater than 15° is consistent with urethral hypermobility.

It is important to reproduce the incontinence. First, the urologist or urogynecologist will catheterize the bladder to determine the volume of the post-void residual urine. A post-void of greater than 50cc is abnormal. Once catheterized, the bladder is filled and patient is asked to cough and/or Valsalva. Does the patient leak? Often a pressure measuring catheter is used to measure the pressure necessary to produce UI. This is known as a cystometrogram or urodynamics. Finally urodynamics are used to determine the compliance of the bladder. The non-compliant bladder often presents with symptoms of urge incontinence. A urinalysis should be performed to rule out a urinary tract infection and glucosuria.

The questions to answer on PE are:

- Is the urethra mobile?
- Does the patient have UI with Valsalva or cough?
- Does the patient have other vaginal problems (cystocele, enterocele, rectocele, atrophic vaginitis)?

Questions to be answered on Urodynamics include:

- Is the bladder compliant?
- At what pressure does the patient leak (Valsalva leak point pressure)?

Of note, a normal urethra will not leak at any pressure.

Treatment Options

The vast majority of patients with UI can be cured or improved. The history and PE with urodynamics will allow the clinician to determine if the UI is secondary to a bladder problem or a urethral problem, or combination. Bladder problems are generally treated medically, whereas urethral problems are generally treated surgically.

Bladder problems produce urge incontinence. Diet modification, decreasing the consumption of bladder irritants such as caffeine carbonated beverages, spicy foods and artificial sweeteners, are often helpful. Medications, namely anticholinergics such as oxybutynin chloride (Ditropan), hyoscyamin, and Tolteradine, are quite effective at delaying or preventing premature bladder contractions. Behavior modification, such as bladder retraining or timed voiding, increases the time intervals between voids, and is often helpful.

Urethral problems are treated primarily with surgery if conservative measures such as Kegel exercise and estrogen replacement have

Table 1.—Types of Urinary Incontinence		
Type	**Pathophysiology**	**Signs and Symptoms**
Urge Incontinence	■ Involuntary bladder contractions	■ Leaks on way to toilet.
Overflow Incontinence	■ Bladder overdistention and leakage because of impaired sensory feedback from the bladder.	■ Poor urinary stream ■ Constant dribbling ■ No sensation of fullness
Stress Urinary Incontinence(SUI)	■ Bladder neck/urethral hypermobility	■ Incontinence with cough, sneeze, or Valsalva
Intrinsic Sphincter Deficiency (ISD)	■ Urinary sphincter failure	■ Marked incontinence with standing, cough, sneezing, Valsalva

failed. Kegel exercises are designed to strengthen the muscular support of the bladder, vagina, and rectum. There are three main categories of surgeries used to treat SUI: retropubic suspensions (Marshall-Marchetti-Krantz, Burch culposuspension), transvaginal suspensions (Raz, Stamey, Pereyra), and sling procedures. The goal of each is correct urethral hypermobility. The most durable of these procedures is the pubovaginal sling (PVS) procedure. The PVS uses a thin strip of autologous (rectus fascia or fascia lata) or cadeveric fascia to create a hammock-like bolstering of the urethra (see Figure 2). The long-term cure rate of PVS is about 83%.

Patients with ISD refractory to Kegels and estrogen replacement require either PVS or transurethral submucosal collagen injection to coapt the open urethra. Estrogen replacement increases the vascularity of the vaginal mucosa and urethra thereby increasing the coaptability of the urethra. Collagen injection is usually performed as an office based procedure under local anesthetic via a urethroscope. The collagen is injected under the urethral mucosa at the proximal urethra in an attempt to coapt the urethra.

Summary

Urinary incontinence affects an estimated 13 million Americans of which 85% are women. It is an embarrassing and lifestyle limiting condition for which effective treatment is available. Health care providers should be alert to the signs and symptoms of UI and pursue its etiology. Those patients who fail medical therapy, in whom the etiology for the incontinence is unclear, or those patients with concomitant cystocele, enterocele, or rectocele, should be referred to an incontinence specialist.

References

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